

PATENT

Docket No.: 5350-103D1/10105921

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : MASATOSHI DEGUCHI et al.) Examiner:
Serial No. :) Group Art Unit:
Filed : June 11, 2001)
For : APPARATUS AND METHOD)
FOR APPLYING A PROCESS)
SOLUTION)

July 11, 2001
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PRELIMINARY AMENDMENT

Assistant Commissioner for Patents
Washington, DC 20231

Sir:

Preliminary to the examination of the above application, please make
the following amendments to the application:

IN THE CLAIMS

Please cancel claims 1 through 13, and add new claims 14 through 25
as follows:

-- 14. (New) A process solution applying method in an apparatus comprising a plurality of supply systems configured to supply different types of process solutions to a substrate, each of the supply systems having a supply mechanism configured to change a rate at which a process solution is supplied, the method comprising the steps of:

holding the substrate by a rotatable spin holder;

selecting, by a controller configured to control the supply systems, a supply system corresponding to a process solution selected from the process solutions;

driving, by the controller, the supply mechanism of the selected supply system at a supply rate prescribed for the selected process solution, based on data representing relationships between the process solutions and supply rates prescribed for the same and stored in the controller, thereby supplying the selected process solution to the substrate held by the spin holder; and

rotating the spin holder, thereby rotating the substrate to spread the selected process solution by virtue of a centrifugal force and to coat the substrate with the selected process solution. -

-- 15. (New) The apparatus according to claim 14, wherein each supply rate has such a value that the corresponding process solution applied in a certain

amount forms a process solution film having a uniform thickness on an entire surface of the substrate. --

-- 16. (New) The method according to claim 15, wherein the process solutions are different types of resist solutions, and the certain amount for forming the process solution film is set to be 2.0 ml or less. --

--17. (New) The method according to claim 14, wherein each process solution is supplied by a positive-displacement pump for drawing and discharging the process solution, and a stepping motor for driving the positive-displacement pump and changing a rate of discharging the process solution when controlled in terms of rotation speed. --

-- 18. (New) The method according to claim 14, further comprising a step of detecting, by a detecting section of the supply mechanism of each supply system, the amount of the corresponding process solution remaining in the replaceable supply tank, in accordance with operation of the supply system. --

--19. (New) The method according to claim 14, further comprising a step of detecting, by a detecting section of the supply mechanism of each supply system,

the time at which a replaceable filter is to be replaced, in accordance with operation of the supply system, the filter allowing the corresponding process solution to pass therethrough. –

-- 20. (New) The method according to claim 14, further comprising steps of:

placing respective nozzles for supplying the process solutions at a waiting section disposed outside the spin holder; and

driving, by the controller, a transfer system to pick up one of the nozzles corresponding to the selected supply system, and transfer the nozzle from the waiting section to a position above the substrate. --

-- 21. (New) A resist solution applying method in an apparatus comprising a

plurality of supply systems configured to supply different types of resist solutions to a substrate, each of the supply systems having a supply mechanism configured to change a rate at which a resist solution is supplied, the method comprising the steps of:

holding the substrate by a rotatable spin holder;

placing respective nozzles for supplying the resist solutions at a waiting section disposed outside the spin holder;

selecting, by a controller configured to control the supply systems, a
10 supply system corresponding to a resist solution selected from the resist solutions;

driving, by the controller, a transfer system to pick up one of the
nozzles corresponding to the selected supply system, and transfer the nozzle from
the waiting section to a position above the substrate;

driving, by the controller, the supply mechanism of the selected supply
15 system at a supply rate prescribed for the selected resist solution, based on data
representing relationships between the resist solutions and supply rates prescribed
for the same and stored in the controller, thereby supplying the selected resist
solution to the substrate held by the spin holder, each supply rate having such a
value that the corresponding resist solution applied in a certain amount forms a
20 resist solution film having a uniform thickness on an entire surface of the substrate;
and

rotating the spin holder, thereby rotating the substrate to spread the
selected resist solution by virtue of centrifugal force and to coat the substrate with
the selected resist solution. -

-- 22. (New) The method according to claim 21, wherein the certain
amount for forming the resist solution film is set to be 2.0 ml or less. -

5 -- 23. (New) The method according to claim 21, wherein each resist solution is supplied by a positive-displacement pump for drawing and discharging the resist solution, and a stepping motor for driving the positive-displacement pump and changing a rate of discharging the resist solution when controlled in terms of rotation speed. -


-- 24. (New) The method according to claim 21, further comprising a step of detecting, by a detecting section of the supply mechanism of each supply system, the amount of the corresponding resist solution remaining in a replaceable supply tank, in accordance with operation of the supply system. --

5 -- 25. (New) The apparatus according to claim 21, further comprising a step of detecting, by a detecting section of the supply mechanism of each supply system, the time at which a replaceable filter is to be replaced, in accordance with operation of the supply system, the filter allowing the corresponding resist solution to pass therethrough. -

REMARKS

This preliminary amendment is submitted in order to place the claims in better form for further prosecution. An early action on the merits is awaited.




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